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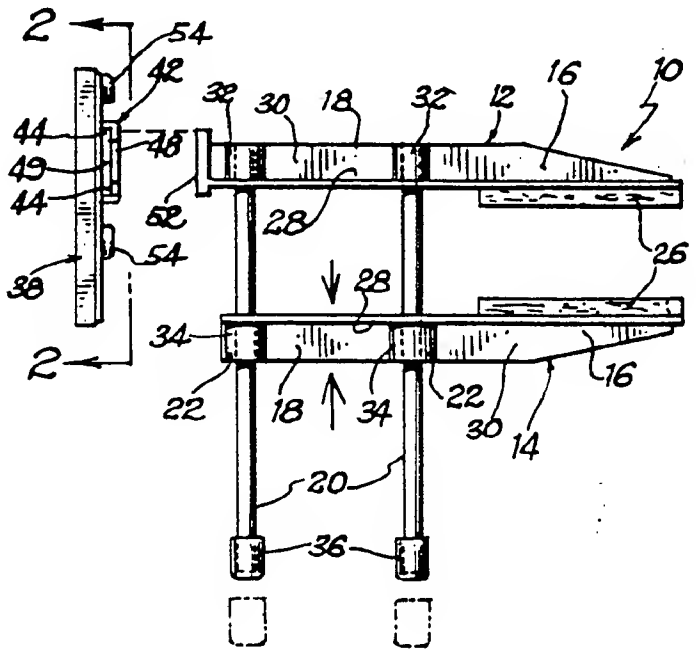

(57) Abstract

A specialized clamp adapted for light work is provided with a pair of spaced parallel jaw members (12, 44) and a pair of parallel rods (20) orthogonally extended relative to the jaw members. One jaw member (12) is fixed to the ends of the rods (20), while the other jaw member (44) is slidable along the rods (20) and lockable thereto by a manually operated canting action. The clamp is alternatively mounted to a wall or surface mount (38). The mount (38) includes a keyway (42) to engage a key (52) on the fixed jaw member (12), and a pair of sockets (54) to alternatively engage the free ends (56) of the rods (20).

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CLAMP WITH MULTI-MODAL MOUNTING

BACKGROUND AND SUMMARY OF THE INVENTION

There are many types of clamps, pliers, wrenches and vices which have two jaws and are designed to bring the two jaws into clamping contact to one another. Typically, in a clamp for example, the concept is to enable the user to have considerable mechanical advantage, generally through use of a threaded shaft and a crank, to compress the jaws together with a great deal of force, perhaps several hundred pounds with simple home shop clamps.

There is not a lot available in the way of clipping and clamping devices which are operative at relatively low compression levels, and which are light weight and highly controllable. For example, the metal clamps used in woodworking and the like are not really suitable for holding a handle on a teacup while the glue dries. Not only because the jaws are generally metallic and would mar the teacup, but also because the screw-type compression generally is not highly controllable, and overtightening might easily result in breaking the handle in two before it was ever fixed in the first place.

Using this same teacup as an example, it would be nice to have a clamp that would operate under controllable, low pressure level and which was light enough that the teacup could be resting in its normal position and clamped in place. Typically, clamps are so heavy that the teacup would roll around into an upended position.

There are such things are alligator clips and the like which will put a moderate degree of pressure on an object or objects. Clips are limited in that the maximum spacing between jaws where the jaws are still reasonably parallel is very limited, because of the pivotal relationship between the jaws. What is needed is a small, very lightweight clamp which slip tight under finger pressure, maintaining the jaws parallel at all times, and permitting a wide opening to be established between the parallel jaws.

Such a need was met by the provision of the SLIP 'N GRIP clamp, which is the subject of co-pending design patent application #562,981, filed December 19, 1983. This clamp has jaws that are made of lightweight plastic ribs sliding on small diameter aluminum rods, with cork tips, making it ideal for small repair jobs and for hobbyists. The jaws are squeezed together, and when they engage an object, the engaging spreads the jaws at a slightly non-parallel orientation wedging them on their rods. The pressure that is applied is thus easily controlled because it is not mechanically multiplied. The cork tips offer further yielding so that the clamp is ideal for small, delicate jobs, for example working with models, balsa wood, china or glass.

To further enhance the effectiveness of the SLIP 'N GRIP clamp, a multi-modal mounting structure has been devised which basically comprises a generally flat base defining a keyway thereon which cooperates with a key defined at the end of one of the clamp jaws to support the clamp in an orthoganal orientation to the surface on which the base is mounted.

In addition to the mounting orientation using the key and the key and the keyway, a pair of spaced sockets defined in the base can serve as an alternative clamp mounting means by virtue of the slide rods which mount the jaws, these rods being insertable into the rod sockets to mount the clamp at an angle orthogonal to the angle achieved by the first mounting technique.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side elevation showing the clamp exploded on the base;

Figure 2 is a front elevation view of the base;

Figure 3 is a rear elevation view of the base;

Figure 4 is an elevation view similar to that of Figure 1 but with the clamp in place in the base;

Figure 5 is a plan view as seen from line 5-5 of Figure 4;

Figure 6 is an elevation view similar to that shown in Figure 4 but showing the rod mount versus the jaw mount arrangement; and,

Figure 7 is a section taken along line 7-7 of Figure 6 illustrating the cross sectional nature of the jaw.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The clamp is shown at 10 and comprises first and second jaw members 12 and 14. These jaw members each have a jaw element 16 and a shank portion 18. A pair of slide rods 20 mount the first jaw member 12 fixedly in its shank portion, and pass through the rod channels 22 in the second jaw portion 14. The rod channels 22 are fairly precisely dimensioned to slide with little or no friction on the aluminum rods 20 but when the jaws compress an object such as that indicated at 24 in Figures 4 and 6, the jaws are scewered slightly out parallelism and hold the jaws at the position to which they are squeezed. Opening the jaws is simply effected by popping the jaws apart again at their shank ends.

The jaw elements 16 are preferably each covered with a cork pad 26 for reasons of achieving both a frictional and a yielding gripping action. The rods 20 are shown as two in number, but could clearly be provided as more, and could even be provided as one. Each of the jaw members 12 and 14 is preferably constructed of a flat lip portion 28 and a reinforcing rib 30 running the length of the lip 28. In the first jaw member, bosses 32 tightly grip the ends of the rods and prevent their axial passage, whereas the bosses 34 in the second jaw member permit the sliding of the rods as described above. The lower ends of the rods as shown in Figure 1 are each covered with a cap 36.

Turning now to the base member 38, this member is a generally planar rectangular piece with screw or nail holes 40 in the corner for mounting to any convenient flat surface. The front of the base defines a keyway 42 comprising integrally molded spaced parallel tracks 44, a stop wall 46 and a front panel 48. The front panel 48 has a slot 50

defined therein to accomodate the flat lip 28 at the base of the shank of the jaw member 12. A key, in the shape of a simple rectangle best seen in Figure 7, slips easily but frictionally into the keyway 42 to mount as shown in Figures 4 and 5. It should be noted that the keyway overlaps the key on three edges, and defines positive support in all directions but the direction from which the key was slipped into the keyway. It thus provides for the mounting of the base on a wall in three different vertical or horizontal positions to achieve correspondingly different orientations of the clamp.

The base 38 also defines rod sockets 54, which are reinforced by being raised from the front surface of the base as shown in Figure 1, 4, 5 and 6. These sockets seat the tip end 56 of the rods 20 after the caps 36 have been removed as shown in phantom in Figure 1. In this orientation, two things occur that did not occur with the previously described mounting method. First, the jaws are now parallel to the working surface, such as a workbench, etc., whereas previously, with the key-and-keyway arrangement, they were orthogonal. Second, as can be seen in Figure 6, the clamp is made more rigid by the fact that the two rods are maintained in spaced relation at a third point, the first two or course being the points at which the rods pass into the shanks of the jaw members.

Thus, the unit is mountable to either a horizontal or a vertical surface, and in either mounting position, will accommodate the jaws alternatively in a vertically extended or horizontally oriented configuration. As any hobbyist or putterer knows, this can be very important as with the infinite variety of shapes and sizes of objects with which one putters, there is virtually no limit to the desirable flexibility of gripping and handling the vices.

In addition to this flexibility, unit is so lightweight and easy to use for small, low-pressure jobs that it fulfills a definite need in the marketplace. It does not compete directly with most handyman style clamps, vices, grip pliers and wrenches, but is in a league by itself.

IN THE CLAIMS:

CLAIMS

1. A clamp with mounting comprising:

a) a clamp comprising:

i) a pair of jaw members having shank portions and jaw elements; and,

ii) at least one slide rod passing through said jaw members and being in sliding relationship with at least one of same such that said jaw members can be slid together on said at least one slide rod causing said jaw elements to approach one another;

b) a base adapted to be mounted on a flat surface and defining a keyway accessible when said base is mounted; and,

c) one of said jaw members defining a key which fits into said keyway to rigidly mount said clamp in operative position.

2. Structure according to Claim 1 wherein said keyway includes a pair of parallel tracks and said key slides between said tracks in engagement therewith.

3. Structure according to Claim 2 wherein said key comprises a substantially planar plate extending generally perpendicularly to the jaw member defining same.

4. Structure according to Claim 3 wherein said keyway defines a socket which laps around and grips said plate on three side edges thereof.

5. Structure according to Claim 3 wherein there are at least two of said rods, and a first of said jaw members fixedly mounts one end of said rods and the second of said jaw members slides on said rods, and said plate is mounted in the first of said rods.

6. Structure according to Claim 5 wherein said base defines a rod socket for each of said rods, said rod sockets being spaced and positioned to seat all of said rods by the ends thereof on side of said second jaw member remote from said first jaw member.

7. Structure according to Claim 6 wherein said rods and rod sockets are each provided as two in number, said base is generally planar and said rod sockets are defined in one side of said base and spaced relation, with said keyway therebetween so that said clamp can be alternatively mounted to said base with said key in said keyway, or, with said rods mounted in said rod sockets.

8. Structure according to Claim 7 wherein said jaw members are generally perpendicular to said rods such that said clamp is mountable in two orthogonally oriented positions.

9. Structure according to Claim 7 wherein said rods have caps for retaining said second jaw member thereon on each of the ends of said rods engaged by said sockets, said caps being removable to permit engagement of said rods in said rod sockets.

10. Structure according to Claim 4 wherein said base is substantially planar and said socket is substantially planar with a front panel parallel to said base, and said plate slides into said socket parallel to and across the front face of said base.

FIG. 1

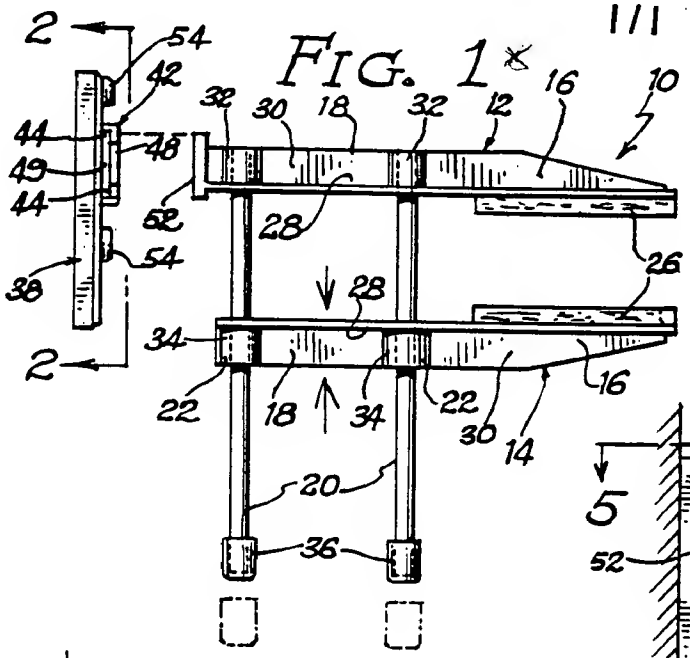


FIG. 2

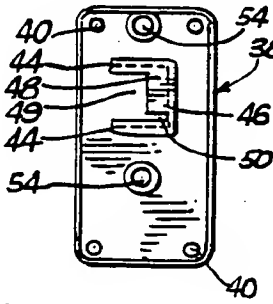


FIG. 3

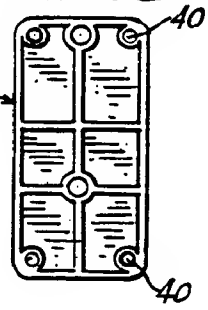


FIG. 4

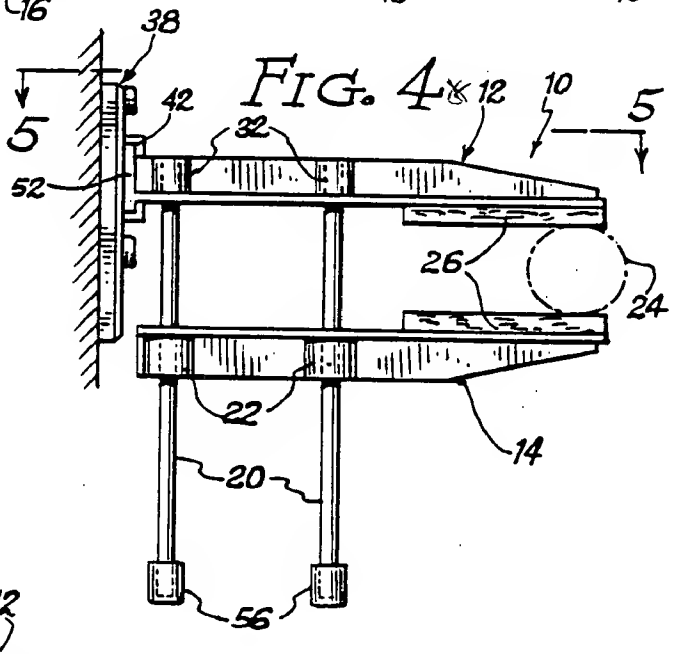


FIG. 5

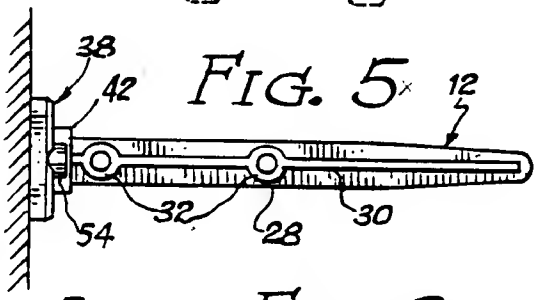


FIG. 6

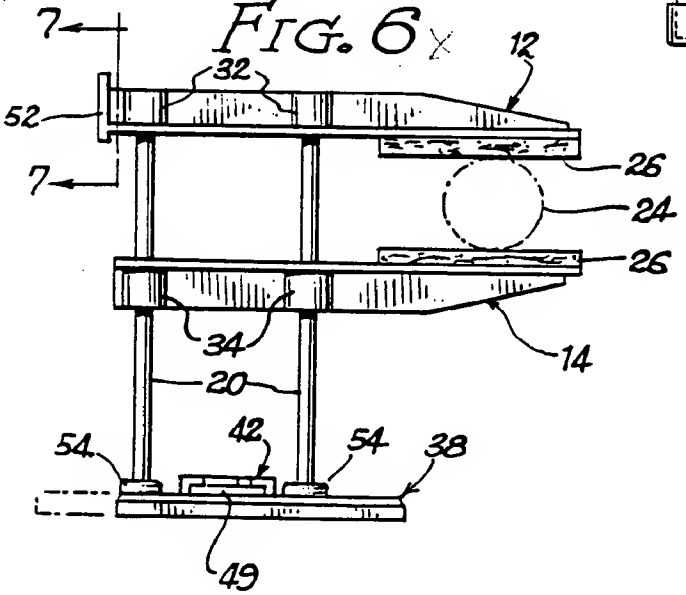
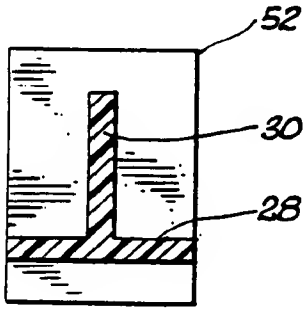


FIG. 7



INTERNATIONAL SEARCH REPORT

International Application No PCT/US85/00420

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

INT. CL. B25B 5/02
US. CL. 269/166

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
US	269/166-171.5, 88, 96, 3-4, 249

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X	US, A, 2,618,168 PUBLISHED 18 NOVEMBER 1952, FERGUSON ET AL.	1-3
Y	US, A, 496,168 PUBLISHED 25 APRIL 1893, PORT	4
Y	US, A, 2,510,077 PUBLISHED 06 JUNE 1950, COFFMAN	1-10
Y	US, A, 4,471,951 PUBLISHED 18 SEPTEMBER 1984, LeVINE	6-9
A	US, A, 4,253,648 PUBLISHED 03 MARCH 1981, MEEKS	2-3
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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
09 APRIL 1985	13 MAY 1985
International Searching Authority [1]	**Signature of Authorized Officer [20]**
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Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No [18]
A	US, A, 4,468,018 PUBLISHED 28 AUGUST 1984, VAIZEY	1
A	US, A, 1,890,042 PUBLISHED 06 DECEMBER 1932, MORANDI	1